

**REMARKS**

Claims 1-15, 18 and 20-38 are currently pending in the subject application, and are presently under consideration. Claims 1-15, 18 and 20-38 are rejected. Claims 1, 25, 30 and 36 have been amended. Favorable reconsideration of the application is requested in view of the amendments and comments herein.

**I. Rejection of Claims 1, 25, 26 and 30 under 35 U.S.C. 102(e)**

Claims 1, 25, 26 and 30 have been rejected under 35 U.S.C. 102(e) as being anticipated by US Patent Application Publication 2003/0052662 to Bi, et al. ("Bi"). Applicant's representative respectfully requests that this rejection be withdrawn for at least the following reasons.

Claim 1 has been amended to make explicit that which was believed to be implicit. Specifically, claim 1 has been amended to recite that a detector receives samples of an input signal state for different time instances of the input signal. Bi does not disclose a detector, as recited in amended claim 1. In rejecting claim 1, the Office Action contends that inverse cosine computing means 290 disclosed in Bi reads on the detector recited in claim 1. Applicant's representative respectfully disagrees. The detector recited in amended claim 1 determines a frequency of an input signal based on samples of the input signal state received by the detector for different time instances of the input signal residing within less than or equal to one period of the input signal. The inverse cosine computing means 290 disclosed in Bi determines an instantaneous frequency  $f_i$  at a time  $t$  based on the equation:  $f_i = (1/(4\pi T)) \cos^{-1}(a_i)$ , where  $T$  is a prescribed sampling interval and " $a_i$ " is an incremented signal at time  $t$  (See Bi, Pars. [0040]-[0041]). That is, Bi teaches computing frequency  $f_i$  from a single incremented signal " $a_i$ " at a given instance in time  $t$ . The incremented signal " $a_i$ " itself is computed by mathematical processes indicated at 230, 250, 260, and 270.

In contrast to the detector recited in amended claim 1, the inverse cosine computing means 290 disclosed in Bi does not receive samples of an input signal state for different time instances of the input signal. Instead, the inverse cosine computing means disclosed in Bi only receives one incremented signal ( $a_i$ ). Accordingly, Bi fails to disclose each and every element of

amended claim 1. Therefore, amended claim 1 is not anticipated by Bi, and amended claim 1 is patentable.

Claim 25 has been amended in a manner similar to claim 1. Specifically, claim 25 has been amended to recite a means for determining a frequency for an input signal based on plural indications of signal state received by the means for determining, that correspond to time instances of the input signal residing within a period of the input signal. For reasons similar to those discussed above with respect to amended claim 1, Bi fails to disclose the means for determining recited in amended claim 25. Accordingly, Bi fails to disclose each and every element of amended claim 25. Thus, amended claim 25, as well as claim 26 depending therefrom, is patentable.

Claim 30 has been amended in a manner similar to claims 25 and 1. Specifically, claim 30 has been amended to recite determining a frequency value for a signal based on output samples received at a detector that correspond to time instances of a signal residing within a single period of the signal. For the reasons stated above with respect to claim 1, Bi fails to disclose this element of amended claim 30. Accordingly, Bi fails to disclose each and every element of amended claim 30. Therefore, amended claim 30 is not anticipated by Bi, and amended claim 30 is patentable.

For the reasons stated above, the rejection of claims 1, 25, 26 and 30 as being anticipated by Bi should be withdrawn. Accordingly, reconsideration and allowance of claims 1, 25, 26 and 30 is respectfully requested.

## II. Rejection of Claim 15 under 35 U.S.C. 102(e)

Claim 15 has been rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,701,445 to Majos ("Majos"). Applicant's representative respectfully requests that this rejection be withdrawn for at least the following reasons.

Majos does not disclose a plurality of delay elements, as recited in claim 15. In rejecting claim 15, the Office Action contends that time delay R1 11 and second delay line 12 disclosed in Majos reads on the plurality of delay elements recited in claim 15 (See Office Action, Page 5). Applicant's representative respectfully disagrees. The plurality of delay elements recited in claim 15 delay a sample signal by a respective known amount of time to provide a respective

clock signal that clocks a respective one of at least a substantial number of storage elements. Conversely, in Majos, the output of time delay R1 11 is provided to an EXCLUSIVE-OR gate 10 (See Majos, FIG. 2). That is, in contrast to the plurality of delay elements recited in claim 15, time delay R1 11 disclosed in Majos does not provide a clock signal that clocks a storage element. Instead, Majos discloses that the time delay R1 11 defines a width of sampling pulses in a transition signal at the output of the EXCLUSIVE-OR gate 10 (See Majos, Lines 23-25). Since Majos fails to disclose each and every element of claim 15, Majos does not anticipate claim 15, and claim 15 is patentable. Thus, reconsideration and allowance of claim 15 is respectfully requested.

### **III. Rejection of Claims 2-9, 11, 27, 28 and 31-35 under 35 U.S.C. 103(a)**

Claims 2-9, 11, 27, 28 and 31-35 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Bi, et al. in view of U.S. Patent No. 6,326,826 to Lee, et al. ("Lee"). This rejection should be withdrawn for at least the following reasons.

Claims 2-9, 11, 27, 28 and 31-35 depend from claims 1, 25 and 30. The addition of Lee does not make up for the aforementioned deficiencies of Bi with respect to claims 1, 25 and 30. Accordingly, Bi taken in view of Lee fails to make claims 2-9, 11, 27, 28 and 31-35 obvious, and claims 2-9, 11, 27, 28 and 31-35 are patentable. Thus, the rejection of claims 2-9, 11, 27, 28 and 31-35 should be withdrawn.

### **IV. Rejection of Claims 10 and 29 under 35 U.S.C. 103(a)**

Claims 10 and 29 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Bi, in view of Lee, and in further view of Majos. This rejection should be withdrawn for at least the following reasons.

Claim 10 depends from claims 8, 7, 5, 2 and 1. The further addition of Majos does not make up for the aforementioned deficiencies of Bi taken in view of Lee with respect to claims 8, 7, 5 and 2, from which claim 10 depends. Additionally, Bi taken in view of Lee and in further view of Majos fails to teach or suggest that an input signal is provided directly to an input of each of the storage elements such that the storage elements provide output samples based on delayed activation by each given clock edge, as recited in claim 10. In rejecting claim 10, the

Office Action contends that in Majos, input H is directly connected to a plurality of storage elements (See Office Action, Page 9). Applicant's representative respectfully submits that even if what the Office Action contends is true, Bi taken in view of Lee and in further view of Majos still does not make claim 10 obvious.

In particular, in claim 10, an input signal is provided directly to an input of each of the storage elements. In contrast, as illustrated in FIG. 2 of Majos, signal H is only provided to flip flops 14 and 16 (e.g., H is not provided to flip flops 15 and 17). Therefore, regardless of which signal, H or D<sub>m</sub>, is considered as the input, such input is not provided directly to an input of each of the storage elements, as recited in claim 10. Moreover, there is no suggestion or motivation to modify Majos to apart from applying improper hindsight in view of the present application. Accordingly, Bi taken in view of Lee and in further view of Majos does not make claim 10 obvious, and claim 10 is patentable.

Claim 29 depends from claims 28 and 25. The further addition of Majos does not make up for the aforementioned deficiencies of Bi taken in view of Lee with respect to claim 28, from which claim 29 depends. Moreover, in rejecting claim 29, Applicant's representative respectfully submits that the Office Action failed to set forth a *prima facie* case of unpatentability regarding claim 29. Accordingly, claim 29 is patentable and Applicant's representative respectfully requests that this rejection of claim 29 be withdrawn.

For the reasons stated above, the rejection of claims 10 and 29 should be withdrawn. Accordingly, reconsideration and allowance of claims 10 and 29 is respectfully requested.

V. Rejection of Claims 12, 13, 36 and 37 under 35 U.S.C. 103(a)

Claims 12, 13, 36 and 37 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Bi in view of Majos. Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claim 12 depends from claim 1. The addition of Majos does not make up for the aforementioned deficiencies of Bi with respect to claim 1, from which claim 12 depends. Additionally, Bi taken in view of Majos fails to teach or suggest a comparator, as recited in claim 12. In rejecting claim 12, the Office Action contends that Majos discloses a frequency comparator 3 that provides a comparison signal H+ and H- based on comparing a desired value

(a frequency of Din) and an actual value (frequency of H) (See Office Action, Page 9). Applicant's representative respectfully disagrees. The comparator recited in claim 12 provides a comparator signal based on a comparison of a value of a frequency for an input signal and a value of a desired frequency. The frequency comparison 3 disclosed in Majos compares four clock signals, namely Q1-Q4 to provide H+ and H-.

Nothing in Majos teaches or suggests that the disclosed frequency comparator 3 compares two frequency values (a desired and an actual), in contrast to the comparator recited in claim 12. Instead, the frequency comparator 3 disclosed in Majos compares actual clock signals Q1-Q4. Accordingly, Bi taken in view of Majos does not teach or suggest the comparator recited in claim 12. Thus, Bi taken in view of Majos does not make claim 12 obvious, and claim 12, as well as claim 13 depending therefrom, is patentable.

Furthermore, claim 36 depends from claim 30. The addition of Majos does not make up for the aforementioned deficiencies of Bi with respect to claim 30, from which claim 36 depends. Additionally, claim 36 has been amended to recite controlling an oscillator to provide a signal at a frequency based on a comparison of a frequency value for the signal relative to a desired frequency value. For the reasons stated above with respect to claim 12, Bi taken in view of Majos fails to teach or suggest this element of amended claim 36, since the frequency comparator 3 disclosed in Majos does not compare frequency values. Therefore, amended claim 36, as well as claim 37 depending therefrom, is patentable.

For the reasons stated above, the rejection of claims 12, 13, 36 and 37 should be withdrawn. Accordingly, Applicant's representative respectfully requests reconsideration and allowance of claims 12, 13, 36 and 37.

## VI. Rejection of Claim 14 under 35 U.S.C. 103(a)

Claim 14 has been rejected under 35 U.S.C. 103(a) as being unpatentable over Bi. Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claim 14 depends from claim 1. Claim 14 is patentable over Bi for at least the same reasons stated above with respect to claim 1, and for the specific elements recited therein. Accordingly, claim 14 is patentable. Therefore the rejection of claim 14 should be withdrawn.

**VII. Rejection of Claims 18 and 21-24 under 35 U.S.C. 103(a)**

Claims 18 and 21-24 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Majos in view of Lee. Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claims 18 and 21-24 depend from claim 15. The addition of Lee does not make up for the aforementioned deficiencies of Majos with respect to claim 15. Accordingly, claims 18 and 21-24 are patentable. Thus, Applicant's representative respectfully requests that the rejection of claims 18 and 21-24 be withdrawn.

**VIII. Rejection of Claims 20 and 38 under 35 U.S.C. 103(a)**

Claims 20 and 38 have been rejected under 35 U.S.C. 103(a) as being unpatentable over Majos. Withdrawal of this rejection is respectfully requested for at least the following reasons.

Claims 20 and 38 depend from claim 15. Thus, claims 20 and 38 are patentable over Majos for at least the same reasons stated above with respect to claim 15, and for the specific elements recited therein.

Additionally, claim 38 recites that a frequency value is expressed in units of an inverse of a period of an input signal. In rejecting claim 38, the Office Action admits that H+ and H- are not expressed in units of an inverse period, but contends that the system disclosed in Majos provides a frequency  $H_{out}$  which is in units of an inverse period of an input signal (See Office Action, Page 12). Applicant's representative respectfully submits that the Office Action has misinterpreted claim 38 and Majos. Specifically,  $H_{out}$ , as disclosed in Majos, is an outgoing recovered clock signal (See Majos, Col.4, Lines 45-46). That is,  $H_{out}$ , as disclosed in Majos, is a clock signal, not a frequency value. Accordingly,  $H_{out}$ , as disclosed in Majos, cannot correspond to the frequency value recited in claim 38, which frequency value is expressed in units of an inverse of a period of an input signal. Accordingly, Majos does not make claim 38 obvious.

For the reasons stated above, the rejection of claims 20 and 38 should be withdrawn. Accordingly, Applicant's representative respectfully requests reconsideration and allowance of claims 20 and 38.

**IX. CONCLUSION**

In view of the foregoing remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Should the Examiner have any questions concerning this paper, the Examiner is invited and encouraged to contact Applicant's undersigned attorney at (216) 621-2234, Ext. 106.

No additional fees should be due for this response. In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to Deposit Account No. 08-2025.

Respectfully submitted,

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